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MS 2043 (2007) (English): VIRGIN COCONUT OIL – SPECIFICATION

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MALAYSIAN STANDARD

MS 2043:2007

VIRGIN COCONUT OIL – SPECIFICATION

ICS: 67.200.10

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Committee representation

The Food and Food Products Industry Standards Committee (ISC U) under whose authority this Malaysian Standard was developed, comprises representatives from the following organisations:

Department of Agriculture Malaysia

Department of Chemistry Malaysia

Department of Standards Malaysia

Federal Agricultural Marketing Authority

Federation of Malaysian Manufacturers

Malaysian Agricultural Research and Development Institute

Malaysian Association of Standards Users

Malaysian Institute of Food Technology

Malaysian Palm Oil Association

Malaysian Palm Oil Board

Ministry of Agriculture and Agro-Based Industry

Ministry of Health Malaysia

Ministry of International, Trade and Industry

Ministry of Science, Technology and Innovation (National Biotechnology Division)

Universiti Kebangsaan Malaysia

Universiti Putra Malaysia

The Working Group on Virgin Coconut Oil which developed this Malaysian Standard consists of representatives from the following organisations:

Federal Agricultural Marketing Authority

Malaysian Agricultural Research and Development Institute

Malaysian Palm Oil Board

Ministry of Health Malaysia

SIRIM Berhad (Secretariat)

Universiti Kebangsaan Malaysia

Universiti Putra Malaysia

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FOREWORD

This Malaysian Standard was developed by the Working Group on Virgin Coconut Oil under the authority of the Food and Food Products Industry Standards Committee.

Compliance with a Malaysian Standard does not of itself confer immunity from legal obligations.

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VIRGIN COCONUT OIL – SPECIFICATION

1. Scope

This Malaysian Standard prescribes the commercial quality requirements of Virgin Coconut Oil (VCO) for human consumption.

2. Normative references

The following normative references are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the normative references (including any amendments) apply.

MS 252: Part 3, *Animal and vegetable fats and oils — Part 3: Determination of saponification value*

MS 817: Part 2, *Methods of test for palm oil and palm oil products — Part 2: Determination of moisture and volatile matter content)*

MS 817: Part 3, *Method of test for palm oil and palm oil products — Part 3: Determination of iodine value*

MS 817: Part 7: Section 1, *Methods of test for palm oil and palm oil products — Part 7: Determination of unsaponifiable matter: Section 1: Method using diethyl ether extraction (Reference method)*

MS 817: Part 7: Section 2, *Methods of test for palm oil and palm oil products — Part 7: Determination of unsaponifiable matter: Section 2: Rapid method using hexane extraction*

MS 817: Part 11, *Palm oil and palm oil products — Part 11: Determination of peroxide value*

MS 817: Part 12, *Palm oil and palm oil products — Part 12: Determination of lovibond colour*

MS 1515: Part 3, *Methods of sampling and test for palm glycerine — Part 3: Determination of Refractive Index*

MS ISO 6321, *Animal and vegetable fats and oils – Determination of melting point in open capillary tubes (Slip point)*

ISO 662, *Animal and vegetable fats and oils – Determination of moisture and volatile matter content*

ISO 6883, *Animal and vegetable fats and oils – Determination of conventional mass per volume (litre weight in air)*

AOCS Official Methods Ce 1e-91, *Official methods and recommended practices of the AOCS, 5th Edition, 1997*

AOAC Official Method 966.23, *Official Methods of Analysis of AOAC International 17th Edition, 2000*

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AOAC Official Method 986-15, *Official Methods of Analysis of AOAC International 17th Edition, 2000*

AOAC Official Method 999.11, *Official Methods of Analysis of AOAC International 17th Edition, 2000*

3. Definition

For the purpose of this Malaysian Standard, the following definition shall applies.

Virgin coconut oil

Virgin coconut oil is obtained from the mature kernel of the coconut (*Cocos nucifera* L.) by mechanical or natural means with or without the application of minimal heat which does not lead to alteration of the product. Extra virgin coconut oil is also considered as virgin coconut oil.

4. Identity characteristics

The product shall meet the chemical and physical properties as specified in Table 1.

Table 1. Chemical and physical properties

Parameter	Range
Relative density, *x* °C/ water at 20 °C	0.908 – 0.926
Refractive index, at 40 °C	1.447 – 1.450
Saponification value, mg KOH/g oil	248 – 265
Iodine value, Wijs method	5.5 – 10.6
Slip Melting Point, °C	24 – 26
Unsaponifiable matter, %	≤ 0.2

5. Essential composition and quality characteristics

5.1 Fatty acid composition

Fatty acid composition of the product shall fall within the appropriate ranges as specified in Table 2.

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Table 2. Fatty acid composition

Fatty acid		
Common name	**Carbon number**	**Composition, %**
Caproic acid	$C_{6:0}$	0.80 – 0.95
Caprylic acid	$C_{8:0}$	8.00 – 9.00
Capric acid	$C_{10:0}$	5.00 – 7.00
Lauric acid	$C_{12:0}$	47.00 – 50.00
Myristic acid	$C_{14:0}$	17.00 – 18.50
Palmitic acid	$C_{16:0}$	7.50 – 9.50
Palmitoleic acid	$C_{16:1}$	Non-detectable
Stearic acid	$C_{18:0}$	2.50 – 3.50
Oleic acid	$C_{18:1}$	4.50 – 6.00
Linoleic acid	$C_{18:2}$	0.70 – 1.50
Linolenic acid	$C_{18:3}$	Non-detectable

5.2 Quality characteristics

VCO shall meet the quality characteristics as specified in Table 3.

Table 3. Quality characteristics

Parameter	Range/Description
Clarity	Water clear (A fully transparent oil at above 30 °C)
Odour and taste	Free from foreign and rancid odour and taste
Free fatty acids	< 0.5 %
Peroxide value	< 3 meq/kg oil
Moisture content	< 0.15 %
Total Plate Count	< 10 cfu/mL
Insoluble impurities	< 0.02 %
Colour	0.1 R ≤ 0.5 Y

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6. Contaminants

6.1 Volatile matter

The product shall contain < 0.2 % volatile matter at 105 °C.

6.2 Pesticide residues

The product shall free from any pesticide residues.

6.3 Others

The product shall comply with maximum limits as follows:

a) Iron (Fe):≤ 5.0 mg/kg

b) Copper:≤ 0.4 mg/kg

c) Lead:≤ 0.1 mg/kg

d) Arsenic:≤ 0.1 mg/kg

7. Hygiene

The product shall be processed and packed under hygienic conditions in premises licensed in accordance with the public health legislations currently enforced in Malaysia.

8. Packaging and labelling

Each individual pack shall be marked to give the following information:

a) name of product "virgin coconut oil";

b) brand name or trade name;

c) nett content;

d) lot identification;

e) name and address of the manufacturer and/or packer, or distributor;

f) product of Malaysia;

g) date of manufacture;

h) best before;

i) ingredients; and

j) nutritional values.

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9. Method of analysis

Product analysis shall be carried out according to the method specified in Table 4.

Table 4. Method of analysis

Type of determination	Method
Relative Density	ISO 6883
Refractive Index	MS 1515: Part 3
Saponification Value (SV)	MS 252: Part 3
Iodine Value (IV)	MS 817: Part 3
Unsaponifiable matter	MS 817: Part 7: Section 1 MS 817: Part 7: Section 2
Slip Melting Points (SMP)	MS ISO 6321
Free fatty acids composition	AOCS Official Methods Ce 1e-91, Official Methods and Recommended Practices of the AOCS, 5th Edition, 1997
Moisture and Volatile matter content	MS 817: Part 2
Moisture and Matter volatile	ISO 662
Peroxide Value (PV)	MS 817: Part 11
Lead, Iron, Copper	AOAC Official Method 999.11, Official Methods of Analysis of AOAC International 17th Edition, 2000
Arsenic	AOAC Official Method 986-15, Official Methods of Analysis of AOAC International 17th Edition, 2000
Total Plate Count	AOAC Official Method 966.23, Official Methods of Analysis of AOAC International 17th Edition, 2000
Colour	MS 817: Part 12

10. Compliance with the specification

Upon testing, when each sample is found to conform to the requirements specified in this standard, the lot, batch or consignment from which the sample has been drawn shall be deemed to comply with this standard.

11. Legal requirements

The product, in all other aspects, shall comply with the requirements of the legislation currently in force in Malaysia.

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Bibliography

[1] *APPC standard for virgin coconut oil.*

[2] *General standard for the labelling of prepackaged foods* (CODEX STAN 1-1985, Rev.1–1991).

[3] *Codex standard for edible fats and oils not covered by individual standards* (CODEX STAN 19–1981, Rev. 2–1999).

[4] *Codex standard for olive oils and olive-pomace oils* (CODEX-STAN 33-1981, Rev. 2–2003).

[5] *Codex standard for named vegetable oils* (CODEX-STAN 210, amended 2003, 2005).

[6] Gonzales, L. A. 2004. *Assessment and Development of Quality Standards for Virgin Coconut Oil Produced From Different Processes.* PQCRD: Philippine Coconut Authority.

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